

REMARKS/ARGUMENTS

Favorable reconsideration of the present application as presently amended and in light of the following discussion is respectfully requested.

Claims 1-61 are pending in the present application with Claims 8, 9, 21, 22, 34, 35, and 56-60 being withdrawn. Claims 1, 3, 17, and 30 are amended and Claim 61 is added by the present amendment.

In the outstanding Office Action, Claims 1-4, 6, 7, 10-13, 16, 17, 19, 20, 23-26, and 29 were rejected under 35 U.S.C. § 102(b) as anticipated by Darwish et al. (U.S. Patent No. 6,008,520, herein "Darwish '520"); Claims 5 and 18 were rejected under 35 U.S.C. § 103(a) as unpatentable over Darwish '520 in view of Lichtenberger et al. (U.S. Patent Application Publication No. 2003/0235959, herein "Lichtenberger"); Claims 14, 15, 27, and 28 were rejected under 35 U.S.C. § 103(a) as unpatentable over Darwish '520 in view of Azam et al. (U.S. Patent Application Publication No. 2004/0070028, herein "Azam"); Claims 30, 32, 33, 36-39, and 42 were rejected under 35 U.S.C. § 103(a) as unpatentable over Darwish '520 in view of Darwish (U.S. Patent No. 6,600,193, herein "Darwish '193"); Claim 31 was rejected under 35 U.S.C. § 103(a) as unpatentable over Darwish '520, Darwish '193, and Lichtenberger; Claims 14 and 41 were rejected under 35 U.S.C. § 103(a) as unpatentable over Darwish '520, Darwish '193, and Azam; and Claims 43-55 were allowed.

Applicants thank the Examiner for the indication of allowable subject matter.

Regarding the rejection of Claims 1-4, 6, 7, 10-13, 16, 17, 19, 20, 23-26, and 29 under 35 U.S.C. § 102(b) as anticipated by Darwish '520, independent Claims 1 and 17 have been amended to recite that an impurity concentration profile is formed in a part of a second semiconductor layer and that part is formed along and directly facing a side surface of a trench. The claim amendments find support in Figures 2 and 3 and their corresponding description in the specification. No new matter has been added.

Briefly recapitulating, independent Claim 1 is directed to a semiconductor device that includes, *inter alia*, a second semiconductor layer and a trench formed in the second semiconductor layer. The second semiconductor has a part formed along and directly facing a side surface of the trench. The part of the second semiconductor layer has an impurity concentration profile including a first peak and a second peak. Independent Claim 17 has been amended similar to independent Claim 1.

In a non-limiting example, Figure 2 show the semiconductor device having the second semiconductor layer 22 with a part (along line AA') formed along and directly facing a side surface of the trench 24. Further, in another non-limiting example, Figure 3 show that the part AA' of the second semiconductor layer 22 has the first peak close to an interface between layers 22 and 23 and the second peak close to an interface between layers 22 and 37.

Turning to the applied art, Darwish '520 shows in Figure 4 a semiconductor device having, among other layers, a P-body layer 116. The outstanding Office Action asserts at page 3, second full paragraph, that the P-body layer 116 of Darwish '520 corresponds to the claimed second semiconductor layer and layer 116 has first and second peaks as indicated by the P+ regions at the top and bottom of the layer 116.

However, the region of the layer 116 that has the two peaks P+ at the top and bottom are not formed along and directly facing a side surface of a trench 102 and 106, as requested by amended Claims 1 and 17. Even more, Darwish '520 does not teach or suggest "an impurity concentration profile" in a part of the layer 116 "formed along and directly facing a side surface of the trench" as required by amended Claims 1 and 17.

Accordingly, it is respectfully submitted that independent Claims 1 and 17 and each of the claims depending therefrom patentably distinguish over Darwish '520.

Regarding the rejections of Claims 5, 14, 15, 18, 27, and 28 under 35 U.S.C. § 103(a) over various combinations of Darwish '520, Lichtenberger, and Azam, the applied art has

been considered but does not cure the deficiencies of Darwish '520 discussed above.

Accordingly, it is respectfully submitted that dependent Claims 5, 14, 15, 18, 27, and 28 are also allowable.

Regarding the rejection of Claims 30, 32, 33, 36-39, and 42 under 35 U.S.C. § 103(a) as unpatentable over Darwish '520 and Darwish '193, independent Claim 30 has been amended similar to independent Claims 1 and 17 discussed above. Further, Darwish '193 has been considered but it fails to teach or disclose the features of amended Claim 30. Thus, Darwish '193 does not cure the deficiencies of Darwish '520. Accordingly, it is respectfully submitted that independent Claim 30 and each of the claims depending therefrom patentably distinguish over Darwish '520 and Darwish '193, either alone or in combination.

Regarding the rejection of Claims 31, 40, and 41 under 35 U.S.C. § 103(a) under various combinations of Darwish '520 and Darwish '193, Lichtenberger, and Azam, those rejections are respectfully traversed because the applied art has been considered but does not overcome the deficiencies of Darwish '520 discussed above. In addition, Claim 31, 40, and 41 dependent from independent Claim 30, which is believed to be allowable as noted above. Accordingly, it is respectfully submitted that dependent Claims 31, 40 and 41 are also allowable.

New Claim 61 has been added to include some features deleted in amended Claim 1. No new matter has been added.

Consequently, in light of the above discussion and in view of the present amendment, the present application is believed to be in condition for allowance and an early and favorable action to that effect is respectfully requested.

Respectfully submitted,

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